What Is Claimed Is:

1. A method for bidirectional single-wire data transmission
of data information between an electronic control unit (2) and
at least one peripheral unit (3) having the following steps:
applying a predefined constant voltage to a driver device (20)
of the electronic control unit (2) to produce voltage-coded
information;

transmitting the voltage-coded information from the driver
device (20) of the electronic control unit (2) to a driver
device (30) of the peripheral unit (3) via a single-wire line
(4);

triggering and powering at least the driver logic of the
driver device (30) and/or the communication logic of the
peripheral unit (3) through the current flow generated by the
applied voltage;

current-coding information occurring on the peripheral unit
(3) due to the triggering thereof; and

uploading the current-coded information from the driver device
(30) of the peripheral unit (3) to the driver device (20) of
the electronic control unit (2) via the single-wire line (4)
during the triggering of the peripheral unit.

2. The method as recited in Claim 1,
wherein the voltage-coded triggering of the peripheral unit
(3) is implemented as a binary signal and the current-coded
upload from the peripheral unit (3) to the electronic control
unit (2) is implemented as an analog signal.

3.   The method as recited in Claim 1,
wherein both the voltage-coded triggering of the peripheral
unit (3) and also the current-coded upload from the peripheral
unit (3) to the electronic control unit (2) are implemented as
binary signals.

4.   A method for bidirectional single-wire data transmission
of data information between an electronic control unit (2) and
at least one peripheral unit (3) having the following steps:
applying a predefined constant current to a driver device (20)
of the electronic control unit (2) to produce current-coded
information;

transmitting the current-coded information from the driver
device (20) of the electronic control unit (2) to a driver
device (30) of the peripheral unit (3) via a single-wire line
(4);

triggering and powering at least the driver logic of the
driver device (30) and the communication logic of the
peripheral unit (3) by the current flow;

voltage-coding information occurring on the peripheral unit
(3) due to the triggering thereof; and

uploading the voltage-coded information from the driver device
(30) of the peripheral unit (3) to the driver device (20) of
the electronic control unit (2) via the single-wire line (4)
during the triggering of the peripheral unit (3).

5.   The method as recited in Claim 4,
wherein the current-coded triggering of the peripheral unit
(3) is implemented as a binary signal and the voltage-coded

upload from the peripheral unit (3) to the electronic control
unit (2) is implemented as an analog signal.

6. The method as recited in Claim 4,
wherein both the current-coded triggering of the peripheral
unit (3) and also the voltage-coded upload from the peripheral
unit (3) to the electronic control unit (2) are implemented as
binary signals.

7. The method as recited in at least one of the preceding
claims,
wherein the information to be uploaded from the peripheral
unit (3) to the electronic control unit (2) is implemented as
a diagnostic signal for diagnosis of the peripheral unit (3).

8. The method as recited in at least one of the preceding
claims,
wherein the information to be uploaded from the peripheral
unit (3) to the electronic control unit (2) is implemented as
an information signal for the further control of the
peripheral unit (3).

9. The method as recited in at least one of the preceding
claims,
wherein the information to be uploaded is voltage-coded and/or
current-coded in such a way that the duration until a signal
edge change of the voltage and/or the current represents the
characteristic variable of the information.

10. The method as recited in at least one of the preceding
claims,
wherein the information to be uploaded is voltage-coded and/or
current-coded in such a way that the state or signal edge

change within a time slot represents the characteristic variable of the information and is interpreted as a bit.

11. A device for bidirectional single-wire transmission of data information between an electronic control unit (2) and at least one peripheral unit (3) having:
first means for producing and transmitting voltage-coded information from a driver device (20) of the electronic control unit (2) to a driver device (30) of the peripheral unit (3) via a single-wire line (4) and for triggering and powering, simultaneously thereto, at least the driver logic of the driver device (30) and the communication logic of the peripheral unit (3); and having
second means for uploading current-coded information of the driver device (30) of the peripheral unit (3) to the driver device (20) of the electronic control unit (2) via the single-wire line (4) during the triggering of the peripheral unit (3).

12. A device for bidirectional single-wire transmission of data information between an electronic control unit (2) and at least one peripheral unit (3) having:
first means for producing and transmitting current-coded information from a driver device (20) of the electronic control unit (2) to a driver device (30) of the peripheral unit (3) via a single-wire line (4) and for triggering and powering, simultaneously thereto, at least the driver logic of the driver device (30) and the communication logic of the peripheral unit (3); and having
second means for uploading voltage-coded information of the driver device (30) of the peripheral unit (3) to the driver device (20) of the electronic control unit (2) via the single-wire line (4) during the triggering of the peripheral unit (3).

13.   The device as recited in Claim 11 or 12,
wherein the electronic control unit (2) is implemented as an
engine control unit.

14.   The device as recited in at least one of Claims 11 to 13,
wherein the peripheral unit (3) is implemented as an ignition
coil (7), fuel injector, or the like.